Sn~all-to-Medium Size Space VLBI Mission for Astrometry

Valery 1. Altunin
Jet Propulsion Laboratory, California Institute of Technology
4800" Oak Grove Dr.,Pasadena,
CA, **91109,** USA
tel: (81 **8)-354-3358,** fax: (818)-393-3299, c-mail: via@dsnra.jpl.nasa.gov

A proposal for a new space VLBI radio astronomy mission for astrometry, is described. The nominal mission includes two identical spacecraft, each equipped with a 4-meter antenna with receiving capabilities in the four frequency bands 8-9 GHz, 22-24 GHz, 32 GHz, and 44-48 GHz, and a 70m class ground antenna. The ultimate goals of the mission are improving the accuracy of radio astrometry measurements to the microarcsecond level in one epoch of measurements and improving the accuracy of the transformation between the inertial radio and optical coordinate reference frames. The scientific tasks of the mission are described in [1]. The proposed radio astrometry mission, if implemented in the time frame 2000-2005, can also be a valuable complement to the new generation of optical astrometry missions that are to be launched in the same period of time.

First estimates shows that such a mission can be built under a budget of about $100 mln (MIDEX-class missions). It can be achieved by using relatively small (4-5m), non-foldable (rigid) space antennas, launched by serial launchers (like the Russian Proton or French Ariane), and an infrastructure (tracking network, etc.) built to support the current SVLBI missions, VSOP and Radioastron. A high sensitivity of the mission interferometer may be achieved by using newly-developed wideband MKIV recording and processing systems and large gmund-based telescopes. The advantages to using an interferometer composed of two small space-based antennas with large gmund-based co-observing telescopes are discussed. This paper will describe the possible technical implementation of such a mission.

References

[1] V.I. Altunin et al., IAU Symposium 172, Paris, July 1995 (in press)